

CLAIMS

[1] A method of diagnosing a system, comprising the steps of:
grasping a total receiving steam amount which is a total amount of
5 steam supplied to an evaluation target steam piping and a total necessary
steam amount which is a total amount of steam required by a steam-using
device in the evaluation target steam piping or grasping a difference
between said total receiving steam amount and said total necessary steam
amount as a total unknown steam amount;

10 grasping a total amount of steam loss which can be solved by a
predetermined system improvement in the evaluation target steam piping
as a total improvable steam loss amount;
based on said grasped total amounts, obtaining a ratio of said total
improvable steam loss amount relative to the total unknown steam amount
15 which is the difference between the total receiving steam amount and the
total necessary steam amount as an improvable unknown steam ratio; or
obtaining a ratio of the total unknown steam amount relative to the
total receiving steam amount and a ratio of a total basis unknown steam
amount relative to a value obtained by subtracting the total improvable
20 steam loss amount from the total receiving steam amount as an unknown
steam ratio and an improved unknown steam ratio, respectively, said total
basis unknown steam amount being a value obtained by subtracting said
total improvable steam loss amount from said total unknown steam
amount; or
25 obtaining a ratio of the total unknown steam amount relative to the
total receiving steam amount and a ratio of a total basis unknown steam
amount relative to the total receiving steam amount as an unknown steam
ratio and an apparent improved unknown steam ratio, respectively, said
total basis unknown steam amount being a value obtained by subtracting
30 said total improvable steam loss amount from said total unknown steam

amount.

[2] The system diagnosing method according to claim 1, wherein the method further comprises a step of performing a trap operation diagnosis on a plurality of evaluation target steam traps mounted in the evaluation target steam piping;

5 based on a result of the trap operation diagnosis, calculating a total trap-passed steam loss amount obtained by aggregating trap-passed steam loss amounts for the total number of evaluation target steam traps; and

10 obtaining, using said total trap-passed steam loss amount as the total improvable steam loss amount to obtain the improvable unknown steam ratio, or the unknown steam ratio and the improved unknown steam ration, or the unknown steam ratio and the apparent improved unknown steam ratio.

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[3] The system diagnosing method according to claim 1, wherein the method further comprises the step of performing a trap operation diagnosis on a plurality of evaluation target steam traps mounted in the evaluation target steam piping and a steam leakage diagnosis for 20 diagnosing steam leakage from respective piping portions of the evaluation target steam piping;

based on a result of the trap operation diagnosis, calculating a total trap-passed steam loss amount obtained by aggregating trap-passed steam loss amounts for the total number of evaluation target steam traps;

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based on a result of the steam leakage diagnosis, calculating a total steam leakage loss amount obtained by aggregating steam leakage loss amounts from the respective piping portions;

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obtaining, using a sum total steam loss amount, which is a sum of said total trap-passed steam loss amount and said total steam leakage loss amount, as the total improvable steam loss amount to obtain the

improvable unknown steam loss ratio, or the unknown steam ratio and the improved unknown steam ration, or the unknown steam ratio and the apparent improved unknown steam ratio.

5 [4] A method of operating an aggregating system for system diagnosis having an inputting means and a calculating means, the method comprising the steps of:

10 receiving, by said inputting means, inputs of result of a trap operation diagnosis performed by a trap diagnotor for diagnosing operational conditions of a plurality of evaluation target steam traps mounted in an evaluation target steam piping and inputs of a total receiving steam amount and a total necessary steam amount of the evaluation target steam piping or an input of a total unknown steam amount which is a difference between the total receiving steam amount and the total necessary steam amount;

15 calculating, by said calculating means and based on the result of the trap operation diagnosis inputted to the inputting means, a total trap-passed steam loss amount obtained by aggregating trap-passed steam loss amounts for all the evaluation target steam traps;

20 based on the total receiving steam amount and the total necessary steam amount or the total unknown steam amount inputted to the inputting means,

25 calculating a ratio of the total trap-passed steam loss amount relative to the total unknown steam amount which is the difference between the total receiving steam amount and the total necessary steam amount, as an improvable unknown steam ratio, or

30 calculating a ratio of the total unknown steam amount relative to the total receiving steam amount and a ratio of a total basis unknown steam amount relative to a value obtained by subtracting the total trap-passed steam loss amount from the total receiving steam amount as an unknown

steam ratio and an improved unknown steam ratio, respectively, said total basis unknown steam amount being a value obtained by subtracting the total trap-passed steam loss amount from the total unknown steam loss, or;

5 calculating a ratio of the total unknown steam amount relative to the total receiving steam amount and a ratio of a total basis unknown steam amount relative to the total receiving steam amount as an unknown steam ratio and an apparent improved unknown steam ratio, respectively, said total basis unknown steam amount being a value obtained by subtracting the total trap-passed steam loss amount from the total unknown steam loss.

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[5] A method of operating an aggregating system for system diagnosis having an inputting means and a calculating means, the method comprising the steps of:

15 receiving, by said inputting means, inputs of results of a trap operation diagnosis performed by a trap diagnotor for diagnosing operational conditions of a plurality of evaluation target steam traps mounted in an evaluation target steam piping and a steam leakage diagnosis performed by a leakage diagnotor for diagnosing steam leakage from respective piping portions of the evaluation target steam piping and 20 inputs of a total receiving steam amount and a total necessary steam amount of the evaluation target steam piping or an input of a total unknown steam amount which is a difference between the total receiving steam amount and the total necessary steam amount;

25 calculating, by said calculating means and based on the result of the trap operation diagnosis inputted to the inputting means, a total trap-passed steam loss amount obtained by aggregating trap-passed steam loss amounts for all the evaluation target steam traps;

30 calculating, by said calculating means and based on a result of the steam leakage diagnosis inputted to the inputting means, a total steam leakage loss amount obtained by aggregating steam leakage loss amounts

from the respective piping portions;

based on the total receiving steam amount and the total necessary steam amount or the total unknown steam amount inputted to the inputting means,

5 calculating a ratio of a sum total steam loss amount relative to the total unknown steam amount which is the difference between the total receiving steam amount and the total necessary steam amount as an improvable unknown steam ratio, said sum total steam loss amount being a sum of the total trap-passed steam loss amount and the total steam leakage
10 loss amount, or;

calculating a ratio of the total unknown steam amount relative to the total receiving steam amount and a ratio of a total basis unknown steam amount relative to a value obtained by subtracting the sum total steam loss amount from the total receiving steam amount, the total basis unknown
15 steam amount being a value obtained by subtracting the sum total steam loss amount from the total unknown steam amount, as an unknown steam ratio and an improved unknown steam ratio, respectively;

calculating a ratio of the total unknown steam amount relative to the total receiving steam amount and a ratio of a total basis unknown steam amount relative to the total receiving steam amount as an unknown steam ratio and an apparent improved unknown steam ratio, respectively, said total basis unknown steam amount being a value obtained by subtracting
20 the sum total steam loss amount from the total unknown steam amount.

25 [6] The method of operating an aggregating system for system diagnosis according to claim 4 or 5, wherein the method further comprises the step of data generating step performed, based on the calculation results of the calculating means, by a data generating means included in the aggregating system for system diagnosis for generating evaluation data
30 having contents indicative of at least the total unknown steam amount and

the improvable unknown steam ratio or evaluation data having contents indicative of at least the total trap-passed steam loss amount, the sum total steam loss amount and the improvable unknown stem ratio or evaluation data having contents indicative of at least the unknown steam ratio and the 5 improved unknown steam ratio or evaluation data having contents indicative of at least the unknown steam ratio and the apparent improved unknown steam ratio.

[7] An aggregating system for system diagnosis, comprising:
10 inputting means for receiving input from a trap diagnotor of result of a trap operation diagnosis performed by the trap diagnotor for diagnosing operational conditions of a plurality of evaluation target steam traps mounted in an evaluation target steam piping and inputs of a total receiving steam amount and a total necessary steam amount of the evaluation target 15 steam piping or an input of a total unknown steam amount which is a difference between the total receiving steam amount and the total necessary steam amount;

20 calculating means for calculating, based on the trap operation diagnosis result inputted to the inputting means, a total trap-passed steam loss amount obtained by aggregating trap-passed steam loss amounts for all the evaluation target steam traps;

25 based on the total receiving steam amount and the total necessary steam amount or the total unknown steam amount inputted to the inputting means,

30 said calculating means further calculating a ratio of the total trap-passed steam loss amount relative to the total unknown steam amount which is the difference between the total receiving steam amount and the total necessary steam amount as an improvable unknown steam ratio, or;

35 said calculating means further calculating a ratio of the total unknown steam amount relative to the total receiving steam amount and a

ratio of a total basis unknown steam amount relative to a value obtained by subtracting the total trap-passed steam loss amount from the total unknown steam loss amount as an unknown steam ratio and an improved unknown steam ratio, respectively, said total basis unknown steam amount 5 being a value obtained by subtracting the total trap-passed steam loss amount from the total unknown steam loss, or;

calculating a ratio of the total unknown steam amount relative to the total receiving steam amount and a ratio of a total basis unknown steam amount relative to the total receiving steam amount as an unknown steam ratio and an apparent improved unknown steam ratio, respectively, said 10 total basis unknown steam amount being a value obtained by subtracting the total trap-passed steam loss amount from the total unknown steam loss.

[8] An aggregating system for system diagnosis, comprising:
15 inputting means for receiving, from a trap diagnotor and a leakage diagnotor respectively, inputs of results of a trap operation diagnosis performed by the trap diagnotor for diagnosing operational conditions of a plurality of evaluation target steam traps mounted in an evaluation target steam piping and a steam leakage diagnosis performed by the leakage diagnotor for diagnosing steam leakage from respective piping portions of 20 the evaluation target steam piping and inputs of a total receiving steam amount and a total necessary steam amount of the evaluation target steam piping or an input of a total unknown steam amount which is a difference between the total receiving steam amount and the total necessary steam 25 amount;

calculating means for calculating, based on the result of the trap operation diagnosis inputted to the inputting means, a total trap-passed steam loss amount obtained by aggregating trap-passed steam loss amounts for all the evaluation target steam traps;

30 said calculating means calculating also, based on a result of the

steam leakage diagnosis inputted to the inputting means, a total steam leakage loss amount obtained by aggregating steam leakage loss amounts from the respective piping portions for the entire evaluation target steam piping;

5 based on the total receiving steam amount and the total necessary steam amount or the total unknown steam amount inputted to the inputting means,

10 said calculating means further calculating a ratio of a sum total steam loss amount relative to the total unknown steam amount which is the difference between the total receiving steam amount and the total necessary steam amount as an improvable unknown steam ratio, said sum total steam loss amount being a sum of the total trap-passed steam loss amount and the total steam leakage loss amount, or;

15 said calculating means further calculating a ratio of the total unknown steam amount relative to the total receiving steam amount and a ratio of a total basis unknown steam amount relative to a value obtained by subtracting the sum total steam loss amount from the total receiving steam amount as an unknown steam ratio and an improved unknown steam ratio, respectively, said total basis unknown steam amount being a value obtained by subtracting the sum total steam loss amount from the total unknown steam loss, or;

20 calculating a ratio of the total unknown steam amount relative to the total receiving steam amount and a ratio of a total basis unknown steam amount relative to the total receiving steam amount as an unknown steam ratio and an apparent improved unknown steam ratio, respectively, said total basis unknown steam amount being a value obtained by subtracting the sum total steam loss amount from the total unknown steam amount.

25 [9] The aggregating system for system diagnosis according to claim 30 7 or 8, wherein the method further comprises data generating means for

generating, based on the calculation results of the calculating means, evaluation data having contents indicative of at least the total unknown steam amount and the improvable unknown steam ratio or evaluation data having contents indicative of at least the total trap-passed steam loss amount, the sum total steam loss amount and the improvable unknown steam ratio or evaluation data having contents indicative of at least the unknown steam ratio and the improved unknown steam ratio or evaluation data having contents indicative of at least the unknown steam ratio and the apparent improved unknown steam ratio.